

A NEW INTERDENTAL SPLINT FOR FRACTURES OF THE LOWER JAW.

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LOOKING over the many forms of interdental splints which have been proposed for the treatment of fractures of the lower jaw, we find that they may be roughly grouped into the following four classes:

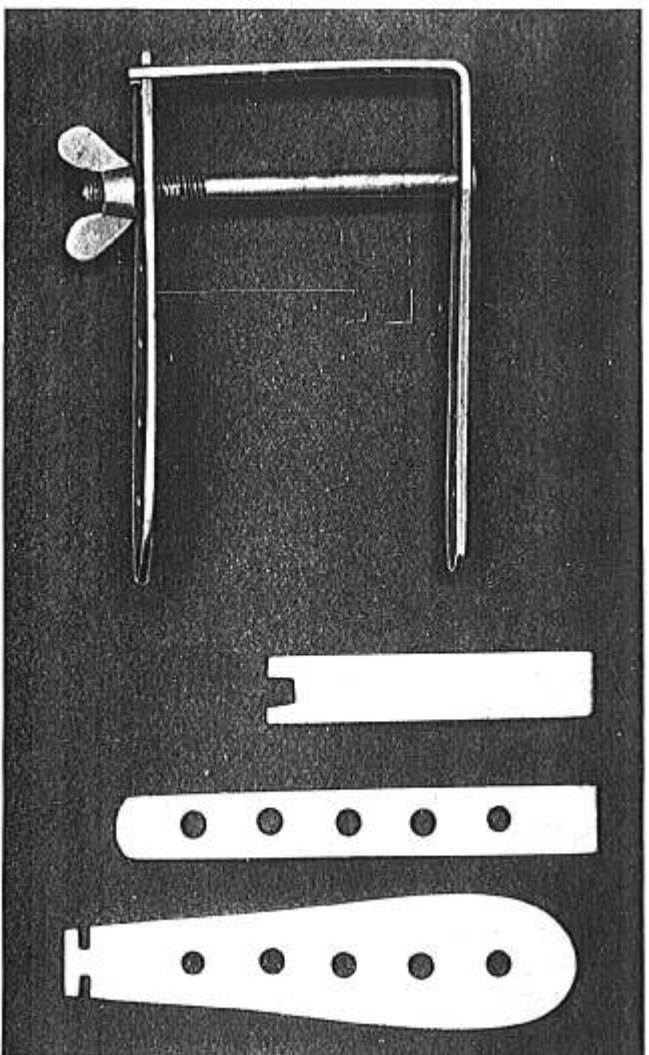
1. Those in which support is derived from the upper and lower teeth, the apparatus fitting as a wedge between them, as in the splints proposed by Lederer, Fuller, Ottolengui, and others.

2. Those in which reduction is maintained by a single splint fastened to the lower teeth as in the methods of Angle and Löhers, or the interdental wire splints of Hammond, Sauer, Claude Martin, of Lyons, or a silver clasp over the crowns of the teeth as employed by Mütter, or steel plates fitted along the anterior and posterior curvatures and retained by a steel clasp as proposed by Nicole.

3. Those in which an interdental plate is held in position by straps, attached to long arms projecting from the plate, as in the apparatus of Kingsley, Gunning, Marshall, and Truman.

4. Those in which there is both downward (interdental) and upward (chin) pressure, as exhibited in the splints of Wales, Sudduth, Lonsdale, Bullock, Moriarty, Ackland, and Matas. Such splints are far to be preferred, for they hold the fractured parts much firmer than the other methods mentioned.

But, as we look over the field of fracture work, we can find hardly a single appliance among the elaborate ones which have been proposed which is still in general use. Nearly all have been relegated and clinical methods of work have taken their places. This is especially true of the various pieces of



The Clamp.

Short
Arm.

Long
Arm.

Clutch-
Piece.

FIG. 1.—The clamp and its parts (natural size).

apparatus for fracture of the mandible. Many of them have been applied successfully by their originators, but have never been generally accepted. Some require a skilled dentist for their application, making them impracticable for clinical work, and thus greatly limiting their field.

It has seemed to me that a splint for this fracture, in order to obtain the greatest degree of usefulness, should fulfil the following requirements:

It should hold the fracture with absolute firmness. It should allow of free use of the lower jaw so as not to interfere with speech or the taking of food. It should not so cover the teeth as to prevent free cleansing of them with antiseptic solutions, for, as these fractures are very likely to be open, oral sepsis is the greatest danger which confronts the surgeon. The splint should be readily accessible to any practitioner doing surgical work. He should be able to make it, if necessary, with the materials at hand, combined with such mechanical assistance as any small town or hamlet may afford. He should be able to apply the splint, if necessary, without professional assistance. As it is not possible in many cases for the patient without force to open his jaws but a slight way after the receipt of the injury, thus preventing the taking of impressions or the moulding of a mouth-piece, the splint should meet this need. It should be worn with comparative comfort, and should not become loosened when the patient assumes his usual sleeping attitude. It should be capable of quick removal for purposes of inspection and rapid readjustment.

The apparatus which I am about to describe meets these requirements. It cannot be used in all cases of fracture of the lower jaw. It is out of the question in fractures of the rami or of the condyloid or coronoid processes, or in those cases of severe comminuted fractures such as are met with in railway surgery or in gunshot injuries. Looking over my records, I find, however, that I could have employed it advantageously in about 90 per cent. of my cases.

This splint is made of spring brass $\frac{3}{64}$ of an inch in thickness and shaped as shown in the accompanying illustration

(Fig. 1). Each clamp consists of two parts, a chin-piece and a piece bent at right angles, making a long and short arm. The chin-piece is wider at one end to prevent its slipping when incorporated into the plaster-of-Paris dressing. It is 8 centimetres long, and provided with a number of holes so that the plaster-of-Paris may sink into them, thus making the dressing more secure. The right-angled piece is 1 centimetre wide, while the arms measure $7\frac{1}{2}$ centimetres and 5 centimetres respectively. The end of the short arm is provided with a simple lock which fits into a corresponding lock in the chin-piece. Three or four holes should be bored into the long arm.

When these two parts are locked, they form a clamp which permits of easy adjustment. This adjustment is accomplished by means of a round head brass machine-screw 6 centimetres in length and carrying a winged nut. This fits into holes in the long arm and the chin-piece at $1\frac{1}{2}$ centimetres distance from the short arm. Such a splint is easily and quickly constructed by any gunsmith or locksmith. After the clamp has been made, it should be heavily nickel plated. The making and plating of the splint will require one day. The clamp as above described has been found to be applicable to thirty-five out of fifty adult jaws. For the other cases, a splint with a short arm of $5\frac{1}{2}$ centimetres answers.

In the absence of proper material, the following plan may be adopted. Tool steel of 1.2 centimetres width is employed. This is shaped as above described, with the exception that the chin-piece is of the same width throughout its extent. If the screws and nuts are not to be obtained, the parts can be fastened together with wire. The apparatus is clumsy in appearance, but answers the purpose very well. I employed it with excellent results in my first case.

The splint is applied with the patient lying in the dorsal position upon the operating table. The face is cleanly shaven and the fracture reduced. A thin layer of felt or layers of sheet wadding are then fitted neatly over the chin and under the jaw, extending as far back as the rami. Over this a plaster-of-Paris bandage is carefully folded, the operator rubbing the



FIG. 2.—The interdental splint in position.

plaster well in as he proceeds. The bandage is carried back on each side to the ramus, where the turns are held by an assistant or by the patient. When the jaw is well covered the splints are applied, the parts being held together by the screws and nuts. The long arms are placed directly over the molar and bicuspid teeth, extending as far back as the last molars and emerging at the corners of the mouth. The chin-pieces are pressed into the plaster. They should run along the body of the jaw. The apparatus being in position, a few more turns of the bandage are taken and the dressing completed by rubbing in dry plaster-of-Paris. Accurate coaptation is desired.

When dry, the chin-pieces are detached from the interdental portions and the plaster-of-Paris dressing removed and trimmed to the desired shape. The dressing is then reapplied to the jaw. The interdental portions of the splints, together with some dental compound, such as is commonly used by dentists in taking impressions, are thrown into hot water. When sufficiently softened, the dental compound is applied along the under surface of the interdental arms, and these are quickly placed upon the teeth, in the same position as in the first application, and pressed firmly down so that the splints rest upon an even bed, the dental compound filling up the holes which have been bored into the long arms. The short arms are then locked to the chin-pieces, the screws reapplied, and the apparatus tightened by means of the winged nuts.

The application of the apparatus requires but little skill, and can easily be done with no other assistance than that which the patient can furnish. If properly made, uniform pressure will be exerted by the plaster-of-Paris cap and no excoriations of the skin will result. By means of the action of the two parallel lines of force, each splint holds its half of the mandible as in a vise, while spreading is prevented by the closely fitting plaster-of-Paris dressing (Fig. 2). Firm pressure upon the molar teeth, so necessary in the treatment and in the retention of the apparatus, is exerted. My first case was one of open fracture between the right canine and the second incisor in which great mobility existed. The fracture, after being in-

effectually treated for six weeks by other methods, was firmly united after this splint had been in position three weeks. The apparatus furnishes a quick and ready method of treatment, and my experience with it thus far has been most satisfactory. In one instance I applied the splint to a most irregular set of teeth. As in these cases there is danger of the apparatus loosening, allowing the long arms to slip off the molars, it will be best to so construct the splint as to leave several tabs projecting from the long arms. These can be turned down at right angles, thus making the dressing perfectly secure.

In conclusion, I desire to express my thanks to Professor Harry M. Sherman, head of my department in the University of California, for valuable advice and for the clinical opportunities for study which he has given me; also to G. Edward Luce, an expert mechanic, who has been of the greatest assistance in working out the details of this splint.